Evolution

650/650 Rack 1U
850/850 Rack 1U
1150/1150 Rack 1U
1550/1550 Rack 1U

Installation and user manual

THE UNINTERRUPTIBLE POWER PROVIDER

MGE
UPS SYSTEMS

Thank you for selecting an MGE UPS SYSTEMS product to protect your electrical equipment.

The **Evolution** range has been designed with the utmost care.
We recommend that you take the time to read this manual to take full advantage of the many features of your **UPS** (**U**ninterruptible **P**ower **S**ystem).

Before installing **Evolution**, please read the booklet presenting the safety instructions. Then follow the indications in this manual.

To discover the entire range of MGE UPS SYSTEMS products and the options available for the **Evolution** range, we invite you to visit our web site at www.mgeups.com or contact your MGE UPS SYSTEMS representative.

Environmental protection

MGE UPS SYSTEMS has implemented an environmental-protection policy.
Products are developed according to an eco-design approach.

Substances

This product does not contain CFCs, HCFCs or asbestos.

Packing

To improve waste treatment and facilitate recycling, separate the various packing components.

- The cardboard we use comprises over 50% of recycled cardboard.
- Sacks and bags are made of polyethylene.
- Packing materials are recyclable and bear the appropriate identification symbol

.

Material	Abbreviation	Number in the symbol
Polyethylene terephthalate	PET	01
High-density polyethylene	HDPE	02
Polyvinyl chloride	PVC	03
Low-density polyethylene	LDPE	04
Polypropylene	PP	05
Polystyrene	PS	06

Follow all local regulations for the disposal of packing materials.

End of life

MGE UPS SYSTEMS will process products at the end of their service life in compliance with local regulations.
MGE UPS SYSTEMS works with companies in charge of collecting and eliminating our products at the end of their service life.

Product
The product is made up of recyclable materials.
Dismantling and destruction must take place in compliance with all local regulations concerning waste.
At the end of its service life, the product must be transported to a processing centre for electrical and electronic waste.

Battery
The product contains lead-acid batteries that must be processed according to applicable local regulations concerning batteries.
The battery may be removed to comply with regulations and in view of correct disposal.
The "Material Safety Data Sheets" (MSDS) for the batteries are available on our web site*.

(*) For more information or to contact the Product Environmental manager, use the "Environmental Form" on the site: www.mgeups.com -> About us -> Environment.

Introduction

Pictograms

Important instructions that must always be followed.

Information, advice, help.

Visual indication.

Action.

Audio signal.

In the illustrations on the following pages, the symbols below are used:

LED off

LED on

LED flashing

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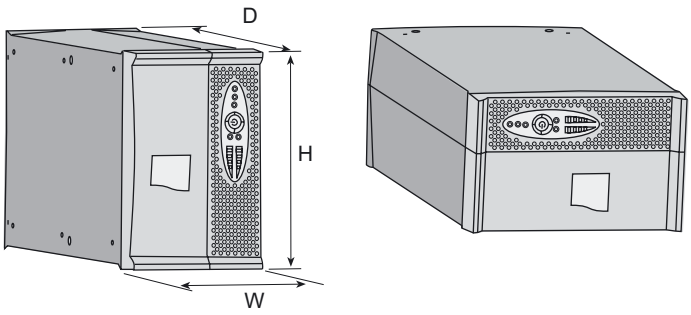
1. Presentation

1.1 Standard positions

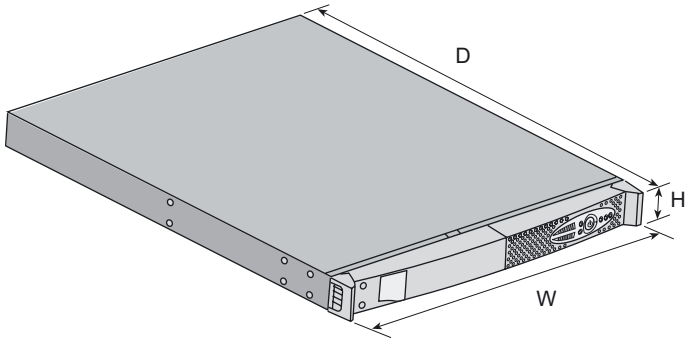
Tower models



Dimensions (H x W x D) in mm	
Evolution 650	234 x 147 x 418
Evolution 850	234 x 147 x 418
Evolution 1150	234 x 147 x 418
Evolution 1550	234 x 147 x 492

Weights in kg	
Evolution 650	8.4
Evolution 850	10.8
Evolution 1150	12.5
Evolution 1550	16.5

Rack models

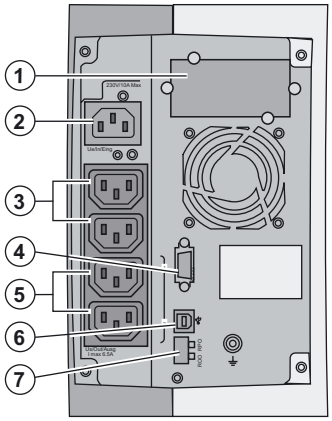


Dimensions (H x W x D) in mm	
Evolution 650 Rack	43.5 x 438 x 366
Evolution 850 Rack	43.5 x 438 x 512
Evolution 1150 Rack	43.5 x 438 x 512
Evolution 1550 Rack	43.5 x 438 x 556

Weights in kg	
Evolution 650 Rack	10.1
Evolution 850 Rack	16.1
Evolution 1150 Rack	16.6
Evolution 1550 Rack	20

1.2 Rear panels

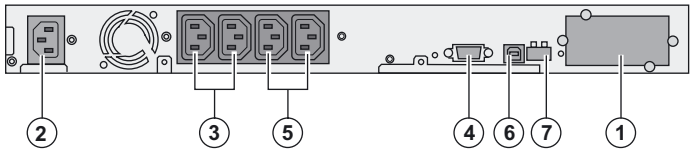
Evolution 650/850/1150/1550



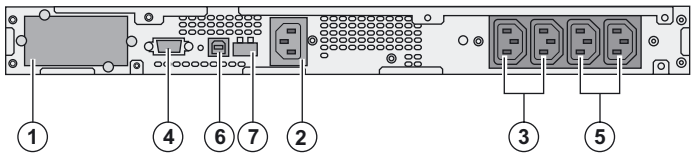
(1) Slot for optional communication card
(2) Socket for connection to AC-power source
(3) 2 outlets for connection of equipment
(4) RS232 communication port
(5) 2 programmable outlets (1 and 2) for connection of equipment
(6) USB communication port
(7) Connector for remote ON/OFF and RPO (Remote Power Off) control

Evolution 650/850/1150/1550 Rack

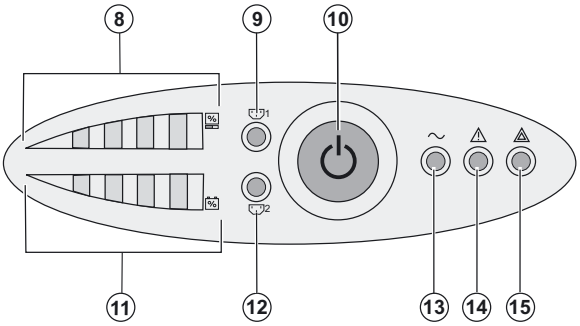
Evolution 650/850/1150 Rack



Evolution 1550 Rack

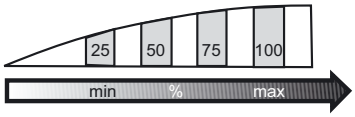


1.3 Control panel



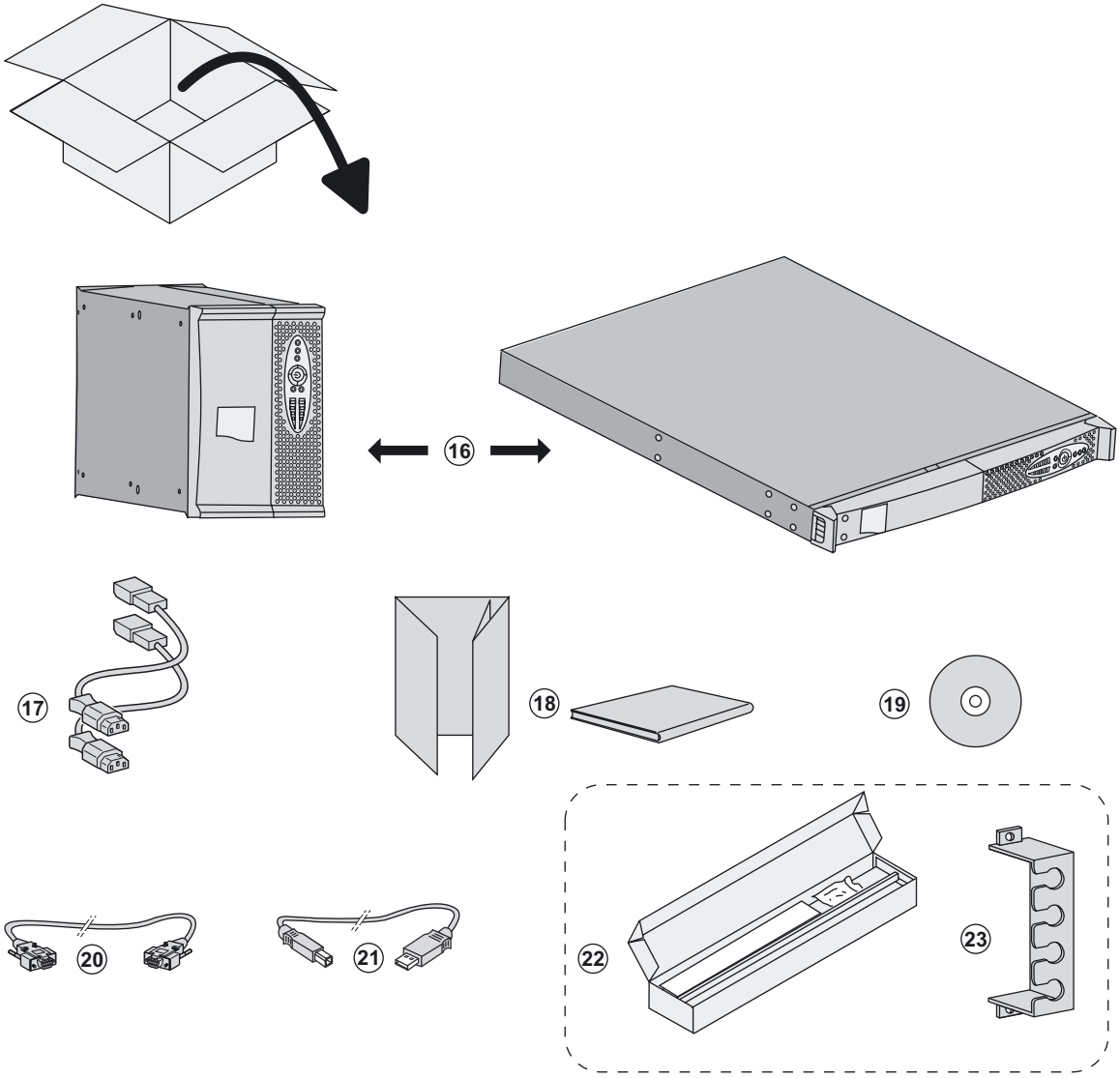
(8) Bargraph indicating the percent load
(9) Programmable outlet 1 is supplied
(10) ON/OFF button for UPS and outlets
(11) Bargraph indicating battery-charge level
(12) Programmable outlet 2 is supplied
(13) Load protected LED
(14) Downgraded operation LED
(15) Load not protected LED

Bargraphs (8) and (11)



2. Installation

2.1 Unpacking and contents check



(16) Evolution UPS, tower or rack model

(17) 2 connection cables for the protected equipment

(18) Documentation

(19) Solution-Pac CD-ROM

(20) RS232 communication cable

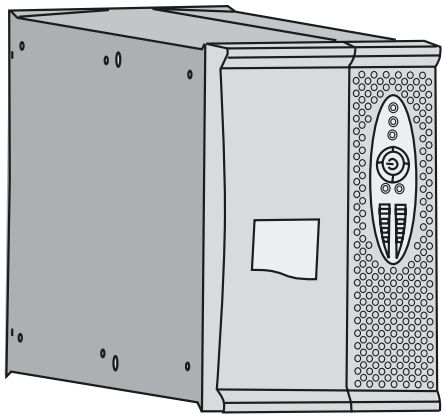
(21) USB communication cable

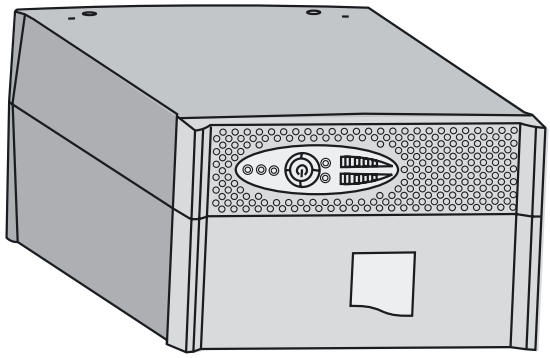
(22) Mounting kit for 19-inch bays (rack model only, except 650 Rack)

(23) System to secure power plugs (rack model only)

Packing materials must be disposed of in compliance with all local regulations concerning waste. Recycling symbols are printed on the packing materials to facilitate sorting.

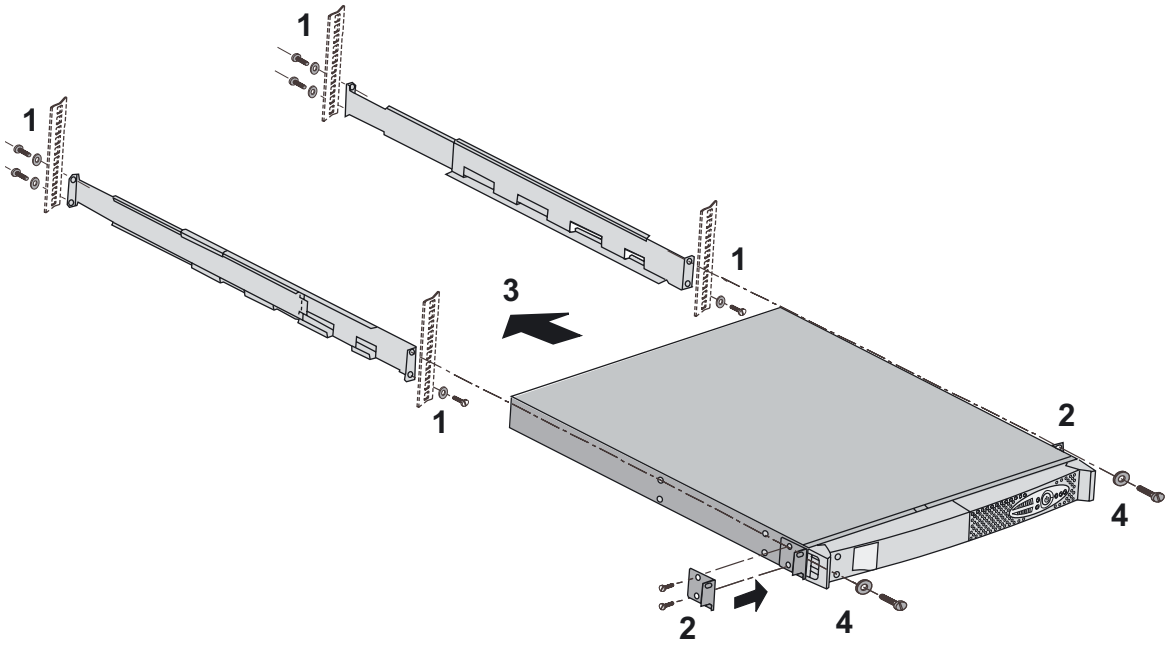
2.2 Installation of tower model





2.3 Installation of rack model

Follow steps 1 to 4 for module mounting on the rails.

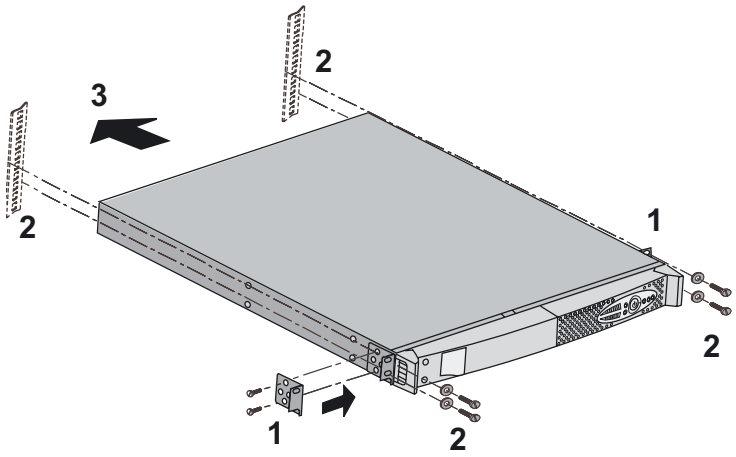


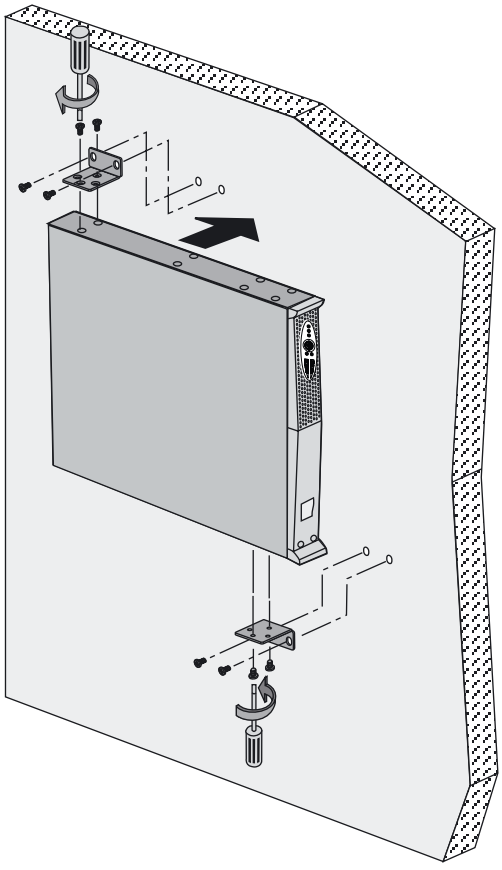
The rails and necessary hardware are supplied by MGE UPS SYSTEMS.

2. Installation

2.4 Installation of the 650 rack model

Follow steps 1 to 3 for rack mounting.



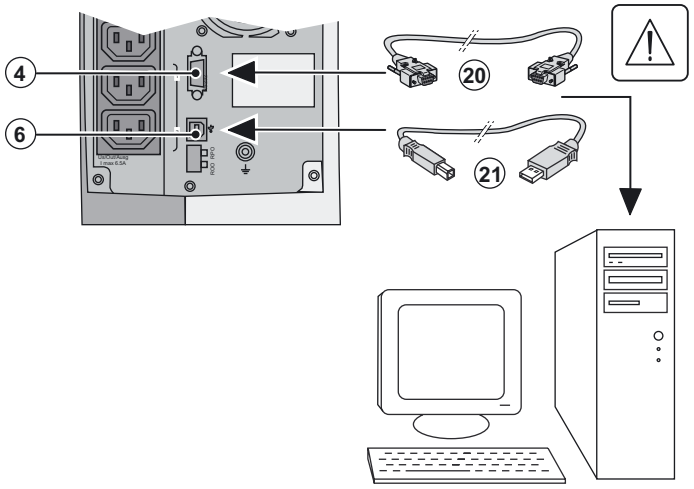


The necessary hardware is supplied by MGE UPS SYSTEMS.

2.5 Communication ports

Connection of RS232 or USB communication port (optional)

The RS232 and USB communication ports cannot operate simultaneously.

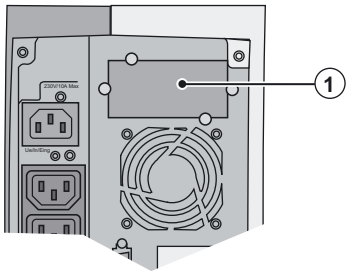


1 - Connect the RS232 **(20)** or USB **(21)** communication cable to the serial or USB port on the computer equipment.

2 - Connect the other end of the communication cable **(20)** or **(21)** to the USB **(6)** or RS232 **(4)** communication port on the UPS.

The **UPS** can now communicate with MGE UPS SYSTEMS power management software.

Installation of the communication cards (optional)

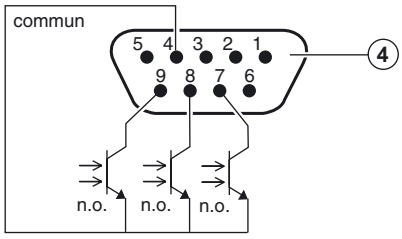


Limited-access slot for the communication card

It is not necessary to shutdown the UPS before installing a communication card.

1 - Remove the slot cover **(1)** secured by screws.
2 - Insert the communication card in the slot.
3 - Secure the card cover with the two screws.

Characteristics of the contact communication port (optional)



- Pins 1, 2, 3, 5, 6: not used
- Pin 4: common (user)
- Pin 7: low battery
- Pin 8: UPS ON, equipment supplied
- Pin 9: operation on battery power

n.o.: normally open contact

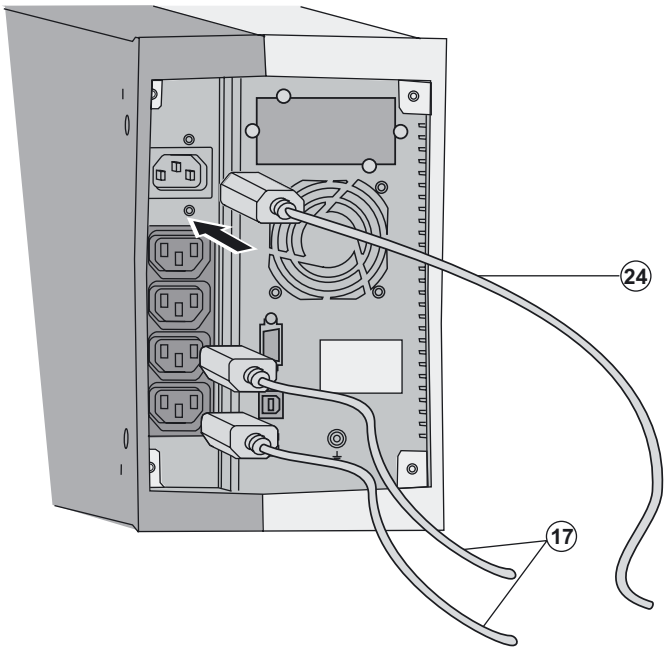
When a signal is activated, the contact is closed between the common (pin 4) and the pin for the corresponding signal.

Contact characteristics (optocoupler)
- Voltage: 48 V DC max
- Current: 80 mA max
- Power: 3.84 W

2. Installation

2.6 Equipment connections

Check that the indications on the name plate located on the back of the UPS correspond to the AC-power source and the true electrical consumption of the total load.

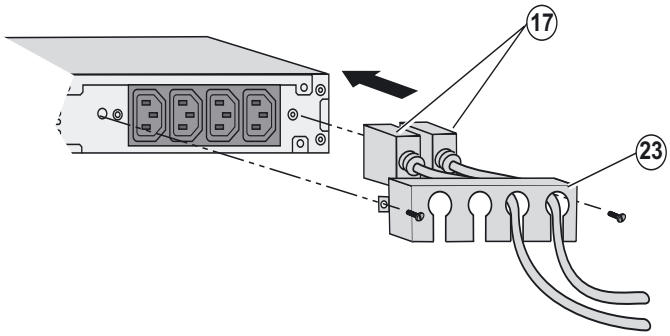


1 - Disconnect the supply cable(1) (not supplied) of the equipment.
2 - Connect the cable to socket **(2)**, then to the AC-power source.
3 - Connect the loads to the UPS using the cables **(17)**.
It is preferable to connect the priority loads to the two outlets marked **(3)** and the non-priority loads to the two programmable outlets marked **(5)** (1 and 2).

To program shutdown of outlets **(5)** during operation on battery power and thus optimise the available backup time, the MGE UPS SYSTEMS communication software is required.

(1) Cable characteristics: 250 V - 10 A (CSA 1mm^2, type HO5).

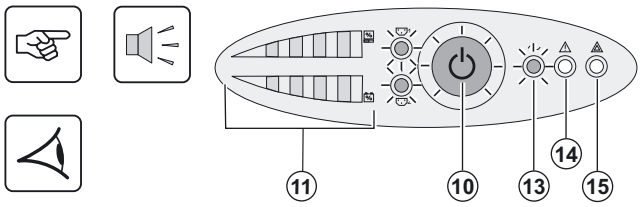
Fit the connection securing system. (rack model only).



4 - Fit the connection securing system **(23)** that prevents the plugs from being pulled out accidentally.

Note. The UPS charges the battery as soon as it is connected to the AC-power source, even if button **(10)** is not pressed. **Once the UPS is connected to the AC-power source, eight hours of charging are required before the battery can supply the rated backup time.**

3.1 Start-up and normal operation



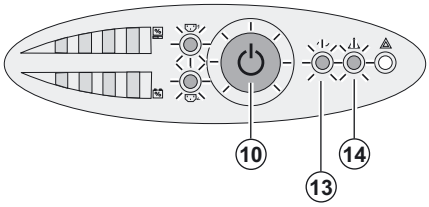
Press button **(10)** for approximately 1 second.
- The buzzer beeps once and all the LEDs go ON simultaneously.
- If AC input power is available, button **(10)** and LED **(13)** are ON. The load is supplied by the AC-power source. Conditions permitting, the UPS runs a battery test, indicated by LEDs **(11)** and the buzzer.
- If AC input power is not available, button **(10)** and LEDs **(13)** and **(14)** are ON. The load is supplied by the UPS on battery power.

The connected devices are protected by the UPS.

If LED **(15)** is ON, a fault has occurred (see the "Troubleshooting" section).

3.2 Operation on battery power

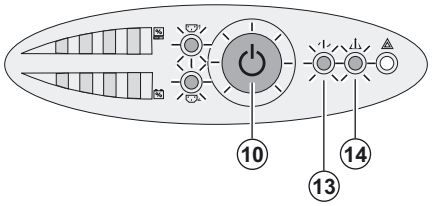
Transfer to battery power



- The connected devices continue to be supplied by the UPS when AC input power is no longer available. The necessary energy is provided by the battery.
- Button **(10)** and LEDs **(13)** and **(14)** are ON.
- The audio alarm beeps every ten seconds.

The connected devices are supplied by the battery.

Low-battery warning



- Button **(10)** and LEDs **(13)** and **(14)** are ON.
- The audio alarm beeps every three seconds.

The remaining battery power is low.
Shut down all applications on the connected equipment because automatic UPS shutdown is imminent.

End of battery backup time

- All the LEDs go OFF.
- The audio alarms stops.

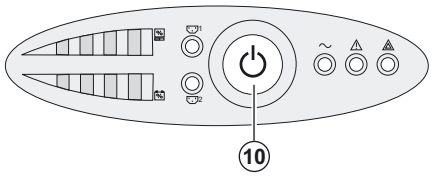
The UPS is completely shut down.

3.3 Return of AC input power

Following an outage, the UPS restarts automatically when AC input power returns (unless the restart function has been disabled via UPS personalisation) and the load is again supplied.

3. Operation

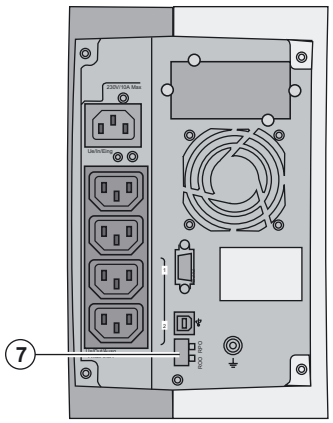
3.4 UPS shutdown



Press button **(10)** for approximately 2 seconds.

The devices connected to the UPS are no longer supplied.

3.5 UPS remote-control functions

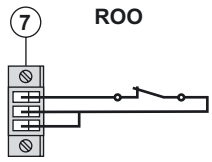


Evolution offers a choice between two remote control functions.
- **RPO** (**R**emote **P**ower **O**ff) allows a remote contact to be used to disconnect all the equipment connected to the UPS.
Restarting the UPS requires manual intervention.
- **ROO** (**R**emote **O**N/**O**FF) allows remote action of button **(10)** to shut down the UPS.

These functions are obtained by opening of the contact connected between the appropriate pins of connector **(7)** on the rear panel of the UPS (see figures below).

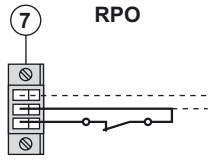
Remote control connection and test

1 - Check that the UPS is OFF and disconnected from the AC input source.
2 - Remove connector **(7)** after unscrewing the screws.
3 - Connect a normally closed volt-free contact (60 V DC / 30 V AC max., 20 mA max., 0.75 mm^2 cable cross-section) between the two pins of connector **(7)** (see diagram).



Contact open: UPS shutdown
Contact closed: UPS start-up (UPS connected to AC power and AC power is available)

Note. The local ON/OFF control using button **(10)** overrides the remote-control function.



Contact open: UPS shutdown, LED **(14)** goes ON

To return to normal operation, deactivate the remote external contact (LED **(14)** goes OFF) and restart the UPS by pressing button **(10)**.

4 - Plug connector **(7)** into the back of the UPS.
5 - Connect and restart the UPS following the previously described procedures.
6 - Activate the external remote shutdown contact to test the function.

Warning. This connector must only be connected to SELV (Safety Extra-Low Voltage) circuits.

4. Access to measurements and personalisation data

◗ Insert the **Solution-Pac** CD-ROM in the drive.
◗ On the first navigation screen, select "Point to Point solution" and follow the instructions on how to install the **Personal Solution-Pac** software.
◗ Then select "Settings", "Advanced settings" and "UPS settings".
Note that the Linux/Unix/MacOS versions of **Personal Solution-Pac** software do not offer this possibility.
It is possible to modify the settings listed below (detailed comments are available in the **Personal Solution-Pac** software).

Main-output personalisation

Function	Factory setting	Other available settings
Output voltage on battery power	230 Volts AC	200/208/220/240 Volts AC
Overload alarm threshold	105%	30/50/70%

Voltage-threshold personalisation

Function	Factory setting	Other available settings
High threshold for transfer to battery	294 Volts AC	271 to 294 Volts AC
Low threshold for transfer to battery	160 Volts AC	160 to 180 Volts AC
Fader activation threshold	265 Volts AC	244 to 265 Volts AC
Booster activation threshold	184 Volts AC	184 to 207 Volts AC
Maximum input-voltage range	Disabled	Enabled (1)

(1) Low threshold for transfer to battery: 150 V.

UPS-sensitivity personalisation

Function	Factory setting	Other available settings
UPS-sensitivity level	Normal	High or low

UPS ON/OFF personalisation

Function	Factory setting	Other available settings
Automatic start	Enabled	Disabled
Cold start	Enabled	Disabled
Forced shutdown	Enabled	Disabled
Energy-savings mode	Disabled	Enabled
UPS ON/OFF controlled by software	Enabled	Disabled
Battery level before restart	0%	0 to 100%

Battery personalisation

Function	Factory setting	Other available settings
Battery-test intervals	Weekly	No test / daily test / monthly test
Low-battery warning	20%	0 to 100%
Battery protection against deep discharge	Enabled	Disabled
Audio alarm	Enabled	Disabled

5. Maintenance

5.1 Troubleshooting

	Indication	Diagnostic	Correction
1	When the UPS is started using button **(10)**, all the LEDs go ON once and the buzzer beeps once, then LED **(14)** remains ON.	The remote power off (RPO) contact has been activated to shut down the UPS and now prevents restart.	Set the contact back to its normal position and press button **(10)** to restart.
2	Button **(10)** and LEDs **(13)** and **(14)** are ON and all the LEDs on bargraph **(8)** flash.	The percent load is greater than the set overload level or UPS capacity.	Check the power drawn by the connected devices and disconnect any non-priority devices. Check the overload level setting.
3	Button **(10)** and LED **(15)** are ON and all the LEDs on bargraph **(8)** are flashing.	A critical overload has occurred on the UPS output. If AC input power fails, the load will not be supplied in battery mode.	Check the power drawn by the connected devices and disconnect any non-priority devices.
4	LED **(15)** is ON and all the LEDs on bargraph **(11)** are flashing.	A battery fault has been detected during the automatic test.	Replace the battery module (see section 5.2, Battery-module replacement).
5	LED **(15)** alone is ON and the buzzer sounds continuously.	A UPS internal fault has occurred and the load is not supplied.	Call the after-sales support department.

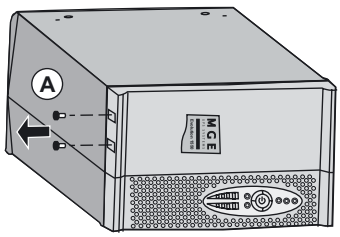
5.2 Replacing the battery module in the tower model

Safety recommendations

The battery can cause electrocution and high short-circuit currents. The following safety precautions are required before servicing the battery components:

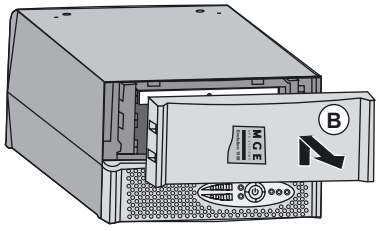
- **Remove watches, rings, bracelets and all other metal objects from the hands and arms,**
- **Use tools with an insulated handle.**

Battery-module removal

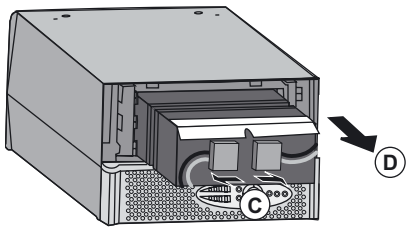


The UPS must be turned as shown in the figure opposite.

A - Remove the two screws on the left-hand side.



B - Lift and pull away the panel with the logo.



C - Pull on the two connectors to disconnect the battery (never pull on the wires).
D - Pull the plastic tab to remove the battery.

Mounting the new battery module

Carry out the above instructions in reverse order.

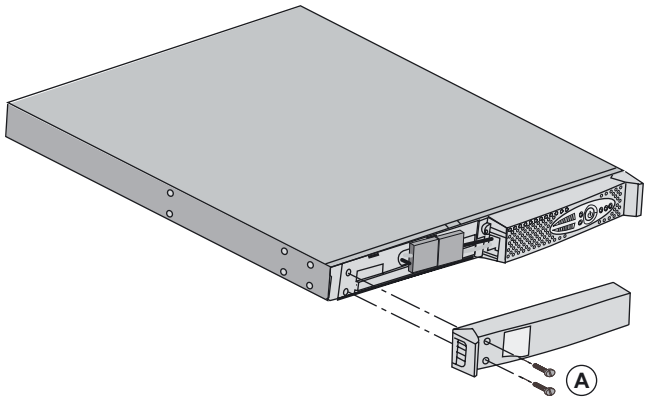
▸To ensure safety and high performance, use only batteries supplied by MGE UPS SYSTEMS.
▸Take care to firmly press together the two parts of the connector during remounting.

5.3 Replacing the battery module in the rack model

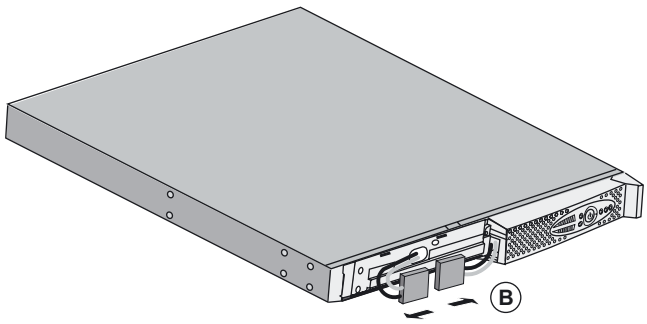
Safety recommendations

The battery can cause electrocution and high short-circuit currents. The following safety precautions are required before servicing the battery components:
▸Remove watches, rings, bracelets and all other metal objects from the hands and arms,
▸Use tools with an insulated handle.

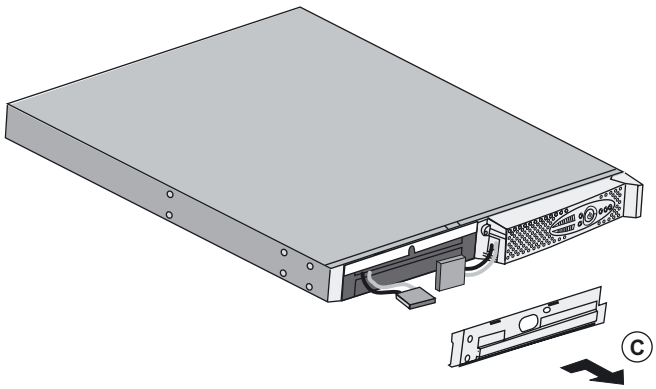
Battery-module removal



A - Remove the two screws on the left-hand side of the front panel.

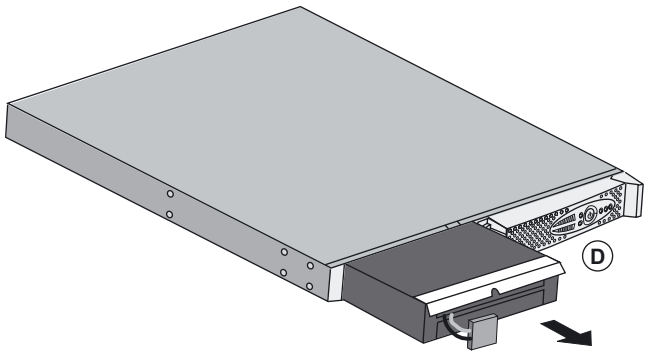


B - Disconnect the battery block by separating the two connectors (never pull on the wires).



C - Remove the part.

5. Maintenance



D - Pull the plastic tab to remove the battery block and replace it.

Mounting the new battery module

Carry out the above instructions in reverse order.

- **To ensure safety and high performance, use only batteries supplied by MGE UPS SYSTEMS.**
- **Take care to firmly press together the two parts of the connector during remounting.**

5.4 Training centre

To fully master operation of your MGE UPS SYSTEMS product and carry out level 1 servicing, see our complete range of technical training courses, available in both French and English.

50 Hz training centre

MGE UPS SYSTEMS
140 avenue Jean-Kuntzmann
Zirst - Montbonnot St-Martin
38334 St-Ismier Cedex FRANCE

Tel. (33) (0)4 76 18 34 14
Fax (33) (0)4 76 18 45 21
training@mgeups.com
www.mgepowerlearning.com
(Catalogue and registration available on line)

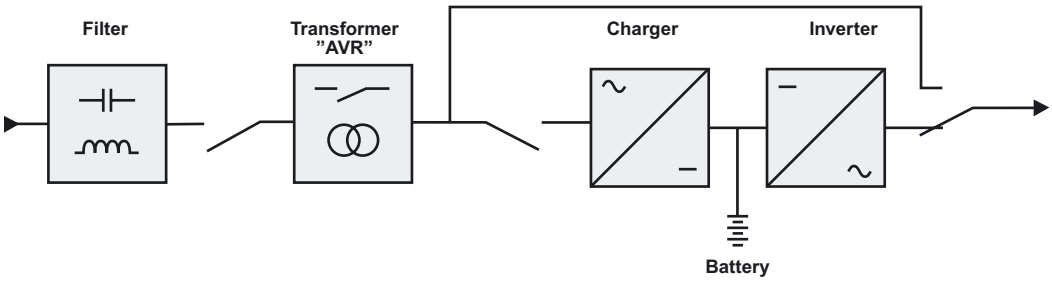
60 Hz training centre

MGE UPS SYSTEMS
1660 Scenic Avenue
Costa Mesa CA 92626 USA

Tel. (1) 714 557 1637
Fax (1) 714 437 9072
technical.training@mgeups.com
www.mgepowerlearning.com
(Catalogue and registration available on line)

6. Appendices

6.1 Technical specifications



Evolution	650 / 650 Rack	850 / 850 Rack	1150 / 1150 Rack	1550 / 1550 Rack
Output power	650 VA / 420 W	850 VA / 600 W	1150 VA / 770 W	1550 VA / 1100 W
AC input power ◗Rated input voltage ◗Input-voltage range ◗50 Hz input-frequency range ◗60 Hz input-frequency range	Single phase 220~240 V 160 V to 294 V (1) 47 Hz to 70 Hz (2) 56.5 Hz to 70 Hz (2)			
Output on battery power ◗Voltage ◗Frequency	230 V (+6% / -10%) (3) 50/60 Hz ±0.1 Hz			
Battery (sealed lead acid, maintenance free) ◗Tower model ◗Rack model	1 x 12 V - 9 Ah 2 x 6 V - 9 Ah	2 x 12 V - 7.2 Ah 4 x 6 V - 7.2 Ah	2 x 12 V - 9 Ah 4 x 6 V - 9 Ah	3 x 12 V - 9 Ah 6 x 6 V - 9 Ah
Environment ◗Operating temperature range	0 to 35°C			0 to 40°C
◗Storage temperature range ◗Humidity ◗Noise level	-25°C to 40°C 20 to 90% (without condensation) < 40 dbA			

(1) The high and low thresholds can be adjusted using **Personal Solution-Pac** software.
(2) Up to 40 Hz in extended frequency mode (programmable using **Personal Solution-Pac** software).
(3) Adjustable to 200 V (10% derating of output power) / 208 V / 220 V / 230 V / 240 V.

When the appliance is used in EU area, use an external circuit breaker in front of line with rating 16A, 250V which is IEC/EN 60898-1 standard compliant;

When the appliance is used in America area, use an external circuit breaker in front of line with rating 20A, 250V.

This product is designed for IT power distribution system.

6.2 Glossary

Backup time	Time during which the load can be supplied by the UPS operating on battery power.
Battery test	Internal UPS test to check battery status.
Booster mode	Automatic UPS mode that steps up the AC voltage if it is too low, to a level above the personalised set-point, without discharging the battery.
Cold start	The devices connected to the UPS can be started even if AC input power is not available. The UPS operates on battery power alone.
Deep discharge	Battery discharge beyond the permissible limit, resulting in irreversible damage to the battery.
Fader mode	Automatic UPS mode that steps down the AC voltage if it is too high, to a level below the personalised set-point, without discharging the battery.
Load	Devices or equipment connected to the UPS output.
Low-battery warning	This is a battery-voltage level indicating that battery power is low and that the user must take action in light of the imminent break in the supply of power to the load.
Normal AC input	The AC-power line supplying the UPS under normal conditions.
Percent load	Ratio of the power effectively drawn by the load to the maximum output of the UPS.
Personalisation	It is possible to modify certain UPS parameters set in the factory. Certain UPS functions can also be modified by the **Personal Solution-Pac** software to better suit user needs.
Programmable outlets	Controllable outlets for automatic load shedding, remote shutdown and sequential restart (personalised using **Personal Solution-Pac** software.
UPS	Uninterruptible Power System.
UPS ON/OFF controlled by software	This function enables or disables initiation of UPS ON/OFF control sequences by computer power-management software.

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